

I. Listing of Claims

1. (Previously presented): A removable filter for capturing thrombi in a blood vessel, the filter comprising:

a plurality of primary struts having first ends connected to each other to define a central axis of the filter, each primary strut having a curved member extending from the central axis and terminating at an anchoring hook to engage the blood vessel at a first axial plane, each curved member having a first curved portion configured to bend away from the central axis in a single curve along the length of each curved member and a second curved portion configured to bend toward the central axis along the length of each curved member; and

a plurality of secondary struts connected to and contacting the curved members of the primary struts and extending therefrom to a free end at a second axial plane to centralize the filter in the blood vessel, the free end not contacting the plurality of primary struts, the primary struts and the secondary struts forming a minimal diameter defining a collapsed configuration of the filter and a maximum diameter defining an expanded configuration of the filter, each secondary strut being formed of a single curve and being secured to one of first curved portions.

2. (Previously presented): The removable filter of claim 1 wherein a set of at least two secondary struts is connected to one primary strut, each secondary strut contacting no primary struts other than the one primary strut, and each secondary strut contacting at least one other secondary strut, the removable filter having a greater number of secondary struts than primary struts, the set of secondary struts extending radially from each side of the one primary strut.

3. (Withdrawn): The removable filter of claim 1 wherein one secondary strut is connected to one primary strut, the secondary strut extending from the primary strut and being in radial alignment with the primary strut.

4. (Canceled)

5. (Canceled)

6. (Previously presented): The removable filter of claim 1 wherein the first and second curved portions are configured to have a non-parallel relationship with the central axis of the filter.

7. (Canceled)

8. (Original): The removable filter of claim 1 wherein the anchoring hook includes a barb for engaging the wall of the blood vessel, the barb being configured to project toward the first end.

9. (Original): The removable filter of claim 1 further comprising:
a hub configured to axially house the first ends of the plurality of primary struts; and
a retrieval hook extending from the hub opposite the plurality of primary struts for removal of the filter from the blood vessel.

10. (Original): The removable filter of claim 1 wherein the second axial plane is defined between the first ends and the anchoring hooks of the plurality of primary struts.

11. (Original): The removable filter of claim 1 wherein each primary strut has a diameter of about 0.015 inch.

12. (Original): The removable filter of claim 1 wherein each primary strut is formed of a superelastic material.

13. (Original): The removable filter of claim 1 wherein each secondary strut has a diameter of 0.012 inch.

14. (Original): The removable filter of claim 1 wherein each secondary strut is formed of a superelastic material.

15. (Original): The removable filter of claim 1 wherein the primary struts and the secondary struts expand to a diameter of about 35 millimeters.

16. (Original): The removable filter of claim 15 wherein the length of each primary strut is about 5 centimeters.

17. (Canceled)

18. (Previously presented): The removable filter of claim 1 wherein the primary struts are configured to pivot at the first ends thereof to move between the collapsed and expanded configurations.

19. (Original): The removable filter of claim 1 wherein each secondary strut is connected to a primary strut by at least one of the following means: laser welding, brazing, or crimping.

20. (Previously presented): A removable filter for capturing thrombi in a blood vessel, the filter comprising:

a plurality of primary struts having first ends axially connected to each other to define a central axis of the filter, each primary strut having a curved member extending from the central axis and terminating at an anchoring hook to engage the blood vessel at a first axial plane, each curved member having a first curved portion configured to bend away from the central axis in a single curve along the length of each curved member and a second curved portion configured to bend toward the central axis along the length of each curved member; and

a plurality of secondary struts connected to and contacting one of the curved members, each secondary strut extending therefrom to a free end at a second axial plane to centralize the filter in the blood vessel, the free end not contacting the plurality of primary struts, the primary struts and the secondary struts forming a minimal diameter defining a collapsed configuration of the filter and a maximum diameter defining an expanded configuration of the filter, the free ends of the secondary struts being configured to engage the blood vessel in the expanded configuration, each secondary strut being formed of a single curve and being

secured to the first curved portion of the curved member such that the secondary strut forms a continuation of the single curve of the first curved portion in the expanded configuration.

21. (Previously presented): The removable filter of claim 20 wherein a set of at least two secondary struts is connected to one primary strut, each secondary strut contacting no primary struts other than the one primary strut, and each secondary strut contacting at least one other secondary strut, the set of secondary struts extending radially from each side of the one primary strut, the removable filter having a greater number of secondary struts than primary struts.

22. (Canceled)

23. (Canceled)

24. (Previously presented): The removable filter of claim 20 wherein the first and second curved portions are configured to have a non-parallel relationship with the central axis of the filter.

25. (Canceled)

26. (Original): The removable filter of claim 20 wherein the anchoring hook includes a barb for engaging the wall of the blood vessel, the barb being configured to project toward the first end.

27. (Original): The removable filter of claim 20 further comprising:
a hub configured to axially house the first ends of the plurality of primary struts; and
a retrieval hook extending from the hub opposite the plurality of primary struts for removal of the filter from the blood vessel.

28. (Original): The removable filter of claim 20 wherein the second axial plane is defined between the first ends and the anchoring hooks of the plurality of primary struts.

29. (Original): The removable filter of claim 20 wherein each primary strut has a diameter of about 0.015 inch.

30. (Original): The removable filter of claim 20 wherein each primary strut is formed of a superelastic material.

31. (Original): The removable filter of claim 20 wherein each secondary strut has a diameter of 0.012 inch.

32. (Original): The removable filter of claim 20 wherein each secondary strut is formed of a superelastic material.

33. (Original): The removable filter of claim 20 wherein the primary struts and the secondary struts expand to a diameter of about 35 millimeters.

34. (Original): The removable filter of claim 33 wherein the length of each primary strut is about 5 centimeters.

35. (Canceled)

36. (Previously presented): The removable filter of claim 20 wherein the primary struts are configured to pivot at the first ends thereof to move between the collapsed and expanded configurations.

37. (Original): The removable filter of claim 20 wherein each secondary strut is connected to a primary strut by at least one of the following means: laser welding, brazing, or crimping.

38. (Previously presented): A removable filter for capturing thrombi in a blood vessel, the filter comprising:

a plurality of primary struts having first ends axially connected to each other to define a central axis of the filter, each primary strut having a curved member extending from the central axis and terminating at an anchoring hook to engage the blood vessel at a first axial plane, each curved member having a first curved portion configured to bend away from the central axis in a single curve along the length of each curved member and a second curved portion configured to bend toward the central axis along the length of each curved member; and

a plurality of secondary struts, one secondary strut connected to and contacting one of the curved members at a point that is non-coaxial with the central axis and extending therefrom to a free end at a second axial plane to centralize the

filter in the blood vessel, the free end not contacting the plurality of primary struts, the primary struts and the secondary struts forming a minimal diameter defining a collapsed configuration of the filter and a maximum diameter defining an expanded configuration of the filter, each secondary strut being formed of a single curve and being secured to one of the first curved portions such that the secondary strut forms a continuation of the single curve of the first curved portion in the expanded configuration.

39. (Withdrawn): The removable filter of claim 38 wherein one secondary strut is connected to one primary strut, the secondary strut extending from the primary strut and being in radial alignment with the primary strut.

40. (Canceled)

41. (Canceled)

42. (Previously presented): The removable filter of claim 38 wherein the first and second curved portions are configured to have a non-parallel relationship with the central axis of the filter.

43. (Canceled)

44. (Original): The removable filter of claim 38 wherein the anchoring hook includes a barb for engaging the wall of the blood vessel, the barb being configured to project toward the first end.

45. (Original): The removable filter of claim 38 further comprising:
a hub configured to axially house the first ends of the plurality of primary struts; and
a retrieval hook extending from the hub opposite the plurality of primary struts for removal of the filter from the blood vessel.

46. (Original): The removable filter of claim 38 wherein the second axial plane is defined between the first ends and the anchoring hooks of the plurality of primary struts.

47. (Original): The removable filter of claim 38 wherein each primary strut has a diameter of about 0.015 inch.

48. (Original): The removable filter of claim 38 wherein each primary strut is formed of a superelastic material.

49. (Original): The removable filter of claim 38 wherein each secondary strut has a diameter of 0.012 inch.

50. (Original): The removable filter of claim 38 wherein each secondary strut is formed of a superelastic material.

51. (Original): The removable filter of claim 38 wherein the primary struts and the secondary struts expand to a diameter of about 35 millimeters.

52. (Original): The removable filter of claim 51 wherein the length of each primary strut is about 5 centimeters.

53. (Canceled)

54. (Previously presented): The removable filter of claim 38 wherein the primary struts are configured to pivot at the first ends thereof to move between the collapsed and expanded configurations.

55. (Original): The removable filter of claim 38 wherein each secondary strut is connected to a primary strut by at least one of the following means: laser welding, brazing, or crimping.

56. (Previously presented): The removable filter of claim 1 wherein each secondary strut is connected to a primary strut of the plurality of primary struts at a point about halfway between the central axis and an outer perimeter of the removable filter in the expanded configuration, the outer perimeter being defined by each anchoring hook.

57. (Previously presented): The removable filter of claim 1 wherein the secondary strut forms a continuation of the single curve of the first curved portion of the primary strut in the expanded configuration, the secondary strut extending from and being in radial alignment with the primary strut.